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23117 7590 01/07/2009

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

BRUCKART, BENJAMIN R

ART UNIT

PAPER NUMBER

2446

DATE MAILED: 01/07/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,546	04/25/2005	Bernie Volz	JRL-2380-1231	7325

TITLE OF INVENTION: METHOD AND SYSTEM FOR ENABLING CONNECTIONS INTO NETWORKS WITH LOCAL ADDRESS REALMS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/07/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

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B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

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B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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23117 7590 01/07/2009

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(Depositor's name)
(Signature)
(Date)

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10/510,546	04/25/2005	Bernie Volz	JRL-2380-1231	7325

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/07/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
BRUCKART, BENJAMIN R	2446	709-245000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB-122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB-47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

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- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
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This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			BRUCKART, BENJAMIN R	
			ART UNIT	PAPER NUMBER
			2446	

DATE MAILED: 01/07/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 29 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 29 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability**Application No.**

10/510,546

Applicant(s)

VOLZ ET AL.

Examiner

BENJAMIN R. BRUCKART

Art Unit

2446

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the interview of 12/8/08.
2. ☒ The allowed claim(s) is/are renumbered to claims 1-60.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 20080611
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Jeffrey Pwu/
Supervisory Patent Examiner, Art Unit 2446

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview and email with John Lastova on 12/8/2008.

The application has been amended as follows:

In the claims:

106. (Currently Amended) A method for supporting establishment of a requested connection between a node of an inside address realm and a node of an outside address realm through an intermediate communication gateway having a gateway address pool comprising a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes, said method comprising the steps of:

i) providing multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node;

ii) performing, prior to initiating establishment of said requested connection, a network address allocation procedure to determine an outside-realm gateway address based on a unique combination of one of said limited number of outside-realm gateway addresses and said multiplexing information, said network address allocation procedure including the steps of:

selecting, from said gateway address pool, a candidate outside-realm gateway address for combination with said multiplexing information,

determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection;

repeating, if the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection, the selecting step until a unique combination is found that is not already being utilized for another connection.

wherein the unique combination of outside-realm gateway address and said multiplexing

information defines an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states, and said determining step is based on a comparison in relation to said predetermined set of existing gateway connection states,

wherein said multiplexing information, for an inside-realm initiated connection, includes at least one of outside node address information and outside node port information, said outside-realm gateway state representation is an at least partially complete gateway state representation, and said predetermined set of gateway connection states includes the existing gateway connection states in said gateway; and

iii) thereafter, initiating establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information.

107. Canceled.

108. (Currently Amended) The method according to claim ~~106~~~~107~~, further comprising the step of maintaining a separate list representation of said predetermined set of existing gateway connection states, and wherein said outside-realm gateway state representation is selected based on comparison with corresponding information of said gateway connection states represented in said list representation.

109. Canceled.

110. (Currently Amended) The method according to claim ~~106~~~~109~~, wherein said

selecting step also includes selecting associated gateway port information for combination with said multiplexing information, said outside-realm representation is a complete outside-realm representation, and said step of initiating establishment of said connection comprises the step of requesting that said gateway creates a gateway connection state based on said complete outside-realm representation.

111. (Currently Amended) The method according to claim ~~106~~¹⁰⁹, wherein said outside-realm representation is a partially complete outside-realm representation, and said step of initiating establishment of said connection comprises the step of requesting that said gateway creates a partially complete gateway connection state based on said partially complete outside-realm representation.

112. (Currently Amended) ~~The method according to claim 107~~^A method for supporting establishment of a requested connection between a node of an inside address realm and a node of an outside address realm through an intermediate communication gateway having a gateway address pool comprising a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes, said method comprising the steps of:

i) providing multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node;

ii) performing, prior to initiating establishment of said requested connection, a network

address allocation procedure to determine an outside-realm gateway address based on a unique combination of one of said limited number of outside-realm gateway addresses and said multiplexing information, said network address allocation procedure including the steps of:

selecting, from said gateway address pool, a candidate outside-realm gateway address for combination with said multiplexing information.

determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection;

repeating, if the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection, the selecting step until a unique combination is found that is not already being utilized for another connection.

wherein the unique combination of outside-realm gateway address and said multiplexing information defines an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states, and said determining step is based on a comparison in relation to said predetermined set of existing gateway connection states,

wherein said multiplexing information, for an outside-realm initiated connection, includes at least one of outside node address information and inside node port information, said outside-realm gateway state representation is a partially complete gateway state representation and said predetermined set of gateway connection states includes the existing partially complete gateway connection states in said gateway; and

iii) thereafter, initiating establishment of said requested connection based on the unique

combination of outside-realm gateway address and said multiplexing information.

113. (Previously Presented) The method according to claim 112, wherein outside-realm gateway addresses of the gateway are traversed until finding an outside-realm gateway address, which in combination with said multiplexing information has no counterpart in any existing partially complete gateway connection state.

114. (Previously Presented) The method according to claim 112, wherein said step of determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises the step of verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information has no counterpart in any existing partially complete gateway connection state.

115. (Previously Presented) The method according to claim 112, wherein said step of initiating establishment of said connection comprises the step of requesting that said gateway establishes a partially complete gateway connection state based on said partially complete outside-realm representation.

116. (Previously Presented) The method according to claim 115, further comprising the step of transforming, upon receipt of a packet from said outside node to said gateway, said partially complete gateway connection state that has been created in said gateway into a

complete gateway connection state based on complementary connection information associated with said packet.

117. (Previously Presented) The method according to claim 116, wherein said multiplexing information is predetermined outside node address information, and said complementary connection information includes inside node port information and outside node port information.

118. (Previously Presented) The method according to claim 116, wherein said multiplexing information is predetermined inside node port information, and said complementary connection information includes outside node address information and outside node port information.

119. (Previously Presented) The method according to claim 112, further comprising the steps of:

- selecting, if it is not possible to find a unique combination based on predetermined inside node port information, another gateway port; and

- selecting an outside-realm gateway address based on said selected gateway port to define a unique, partially complete outside-realm representation of a gateway connection state.

120. (Previously Presented) The method according to claim 112, wherein said

multiplexing information originates from a user-resource identifier query initiated from said outside node.

121. (Currently Amended) The method according to claim ~~407~~112, wherein said connection establishment is based on said outside-realm gateway state representation and a corresponding inside-realm gateway state representation.

122. (Currently Amended) The method according to claim ~~406~~112, further comprising the steps of:

preparing, at said outside node, a user-resource identifier query that includes an inside node identifier as well as said multiplexing information including at least one of outside node address information and inside node port information;

determining inside-realm network address information
based on said inside node identifier included in said identifier query;
selecting, based on said multiplexing information included in said identifier query, said outside-realm gateway address to be used in establishing a dynamic gateway
connection state for a flow between said outside node and said inside node through said gateway;
and

establishing said dynamic gateway connection state based on said selected outside-realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information, thereby enabling an outside-realm initiated

connection.

123. (Previously Presented) The method according to claim 122, wherein said step of establishing said dynamic gateway connection state comprises the steps of:

creating a partially complete gateway connection state based on said selected outside-realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information; and

upon receipt of a packet from said outside node to said gateway, transforming said partially complete gateway state into a complete gateway connection state based on complementary connection information associated with said packet.

124. (Previously Presented) The method according to claim 122, wherein said step of selecting an outside-realm gateway address comprises the step of selecting an outside-realm gateway address, which in combination with said multiplexing information included in said identifier-query defines a partially complete outside-realm gateway state representation that has no counterpart in any existing partially complete gateway connection state.

125. (Previously Presented) The method according to claim 124, further comprising the step of maintaining a separate list representation of existing partially complete gateway connection states, and wherein said partially complete outside-realm representation is

allocated based on comparison with corresponding information of all existing partially complete gateway connection states represented in said list representation.

126. (Previously Presented) The method according to claim 125, wherein outside-realm gateway addresses associated with said gateway are traversed until finding an outside-realm gateway address, which in combination with said multiplexing information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation.

127. (Previously Presented) The method according to claim 125, wherein said step of determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises the step of verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation.

128. (Previously Presented) The method according to claim 123, wherein said multiplexing information included in said identifier query is an outside network address of said outside node, and said complementary connection information for completing the gateway connection state includes a port number of said inside node and a port number of said outside node.

129. (Previously Presented) The method according to claim 123, wherein said multiplexing information included in said identifier query is an inside node port number, and

said complementary connection information for completing the gateway connection state

includes an outside network address of said outside node and a port number of said outside node.

130. (Previously Presented) The method according to claim 122, further comprising the step of notifying said outside node of said selected outside-realm gateway address.

131. (Previously Presented) The method according to claim 122, wherein said user-resource identifier query is a Domain Name Server (DNS) query.

132. (Previously Presented) The method according to claim 122, wherein said inside address realm is a private address realm and said outside address realm is a public address realm.

133. (Currently Amended) A device for supporting establishment of a requested connection between a node of an inside address realm and a node of an outside address realm through an intermediate communication gateway having a gateway address pool comprising a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes, said device comprising:

i) means for providing multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node;

ii) means for network address allocation to determine an outside-realm gateway address

based on a unique combination of one of said limited number of outside-realm gateway addresses and said multiplexing information, said network address allocation means being configured, prior to initiating establishment of said requested connection, for:

selecting, from said gateway address pool, a candidate outside-realm gateway address for combination with said multiplexing information,

determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection;

repeating, if the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection, the selection of outside-realm gateway address until a unique combination is found that is not already being utilized for another connection,

wherein the unique combination of outside-realm gateway address and said multiplexing information defines an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states, and said network address allocation means is configured for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection based on a comparison in relation to said predetermined set of existing gateway connection states,

wherein said multiplexing information, for an inside-realm initiated connection, includes at least one of outside node address information and outside node port information, said outside-realm gateway state representation is an at least partially complete gateway state representation,

and said predetermined set of gateway connection states includes the existing gateway connection states in said gateway; and

iii) means for initiating establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information.

134. Canceled.

135. (Currently Amended) The device according to claim ~~434~~133, further comprising means for maintaining a separate list representation of said predetermined set of existing gateway connection states, and wherein said network address allocation means is configured for finding said outside-realm gateway state representation based on comparison with corresponding information of said gateway connection states represented in said list representation.

136. Canceled.

137. (Currently Amended) The device according to claim ~~436~~133, wherein said network address allocation means is configured for selecting also associated gateway port information for combination with said multiplexing information, said outside-realm representation is a complete outside-realm representation, and said means for initiating establishment of said connection comprises means for requesting that said gateway creates a gateway connection state based on said complete outside-realm representation.

138. (Currently Amended) The device according to claim ~~436~~133, wherein said

outside-realm representation is a partially complete outside-realm representation, and said means for initiating establishment of said connection comprises means for requesting that said gateway creates a partially complete gateway connection state based on said partially complete outside-realm representation.

139. (Currently Amended) ~~The device according to claim 134A~~ a device for supporting establishment of a requested connection between a node of an inside address realm and a node of an outside address realm through an intermediate communication gateway having a gateway address pool comprising a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes, said device comprising:

i) means for providing multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node;

ii) means for network address allocation to determine an outside-realm gateway address based on a unique combination of one of said limited number of outside-realm gateway addresses and said multiplexing information, said network address allocation means being configured, prior to initiating establishment of said requested connection, for:

selecting, from said gateway address pool, a candidate outside-realm gateway address for combination with said multiplexing information;

determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection;

repeating, if the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection, the selection of outside-realm gateway address until a unique combination is found that is not already being utilized for another connection.

wherein the unique combination of outside-realm gateway address and said multiplexing information defines an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states, and said network address allocation means is configured for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection based on a comparison in relation to said predetermined set of existing gateway connection states,

wherein said multiplexing information, for an outside-realm initiated connection, includes at least one of outside node address information and inside node port information, said outside-realm gateway state representation is a partially complete gateway state representation and said predetermined set of gateway connection states includes the existing partially complete gateway connection states in said gateway; and

iii) means for initiating establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information.

140. (Previously Presented) The device according to claim 139, wherein said network address allocation means is configured for traversing outside-realm gateway addresses of the gateway until finding an outside-realm gateway address, which in combination with said

multiplexing information has no counterpart in any existing partially complete gateway connection state.

141. (Previously Presented) The device according to claim 139, wherein said means for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises means for verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information has no counterpart in any existing partially complete gateway connection state.

142. (Previously Presented) The device according to claim 139, wherein said means for initiating establishment of said connection comprises means for requesting that said gateway establishes a partially complete gateway connection state based on said partially complete outside-realm representation.

143. (Previously Presented) The device according to claim 142, further comprising means for transforming, upon receipt of a packet from said outside node to said gateway, said partially complete gateway connection state that has been created in said gateway into a complete gateway connection state based on complementary connection information associated with said packet.

144. (Previously Presented) The device according to claim 143, wherein said

multiplexing information is predetermined outside node address information, and said complementary connection information includes inside node port information and outside node port information.

145. (Previously Presented) The device according to claim 143, wherein said multiplexing information is predetermined inside node port information, and said complementary connection information includes outside node address information and outside node port information.

146. (Previously Presented) The device according to claim 139, further comprising means for selecting, if it is not possible to find a unique combination based on predetermined inside node port information, another gateway port, and means for selecting an

outside-realm gateway address based on said selected gateway port to define a unique, partially complete outside-realm representation of a gateway connection state.

147. (Previously Presented) The device according to claim 139, wherein said multiplexing information originates from a user-resource identifier query initiated from said outside node.

148. (Currently Amended) The device according to claim ~~134~~139, wherein said means for initiating establishment of said connection is configured to operate based on said outside-realm gateway state representation and a corresponding inside-realm gateway state

representation.

149. (Currently Amended) The device according to claim 134139, further comprising:

means, responsive to a user-resource identifier query from said outside node, for determining inside-realm network address information based on an inside node identifier included in said identifier query, wherein said identifier query further includes said multiplexing information including at least one of outside node address information and inside node port information;

means for selecting, based on said multiplexing information included in said identifier query, said outside-realm gateway address to be used in establishing a dynamic gateway connection state for a flow between said outside node and said inside node through said gateway; and

means for establishing said dynamic gateway connection state based on said selected outside-realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information, thereby enabling an outside-realm initiated connection.

150. (Previously Presented) The device according to claim 149, wherein said means for establishing said dynamic gateway connection state comprises:

means for creating a partially complete gateway connection state based on said selected outside-realm gateway address, said multiplexing information included in said identifier query and said inside-realm network address information; and

means for transforming, upon receipt of a packet from said outside node to said gateway, said partially complete gateway state into a complete gateway connection state based on complementary connection information associated with said packet.

152. (Previously Presented) The device according to claim 149, wherein said means for selecting an outside-realm gateway address is operable for selecting an outside-realm gateway address, which in combination with said multiplexing information included in said identifier-query defines a partially complete outside-realm gateway state representation that has no counterpart in any existing partially complete gateway connection state.

152. (Previously Presented) The device according to claim 151, further comprising means for maintaining a separate list representation of existing partially complete gateway connection states, and wherein said network address allocation means is configured for finding said partially complete outside-realm representation based on comparison with corresponding information of all existing partially complete gateway connection states represented in said list representation.

153. (Previously Presented) The device according to claim 152, wherein said network address allocation means is configured for traversing outside-realm gateway addresses associated with said gateway until finding an outside-realm gateway address, which in combination with said multiplexing information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation.

154. (Previously Presented) The device according to claim 152, wherein said means for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection comprises means for verifying that a pre-allocated outside-realm gateway address in combination with said multiplexing information included in said identifier query has no counterpart in any existing partially complete gateway connection state represented in said list representation.

155. (Previously Presented) The device according to claim 150, wherein said multiplexing information included in said identifier query is an outside network address of said outside node, and said complementary connection information for completing the gateway connection state includes a port number of said inside node and a port number of said outside node.

156. (Previously Presented) The device according to claim 150, wherein said multiplexing information included in said identifier query is an inside node port number, and said complementary connection information for completing the gateway connection state includes an outside network address of said outside node and a port number of said outside node.

157. (Previously Presented) The device according to claim 149, further comprising means for notifying said outside node of said selected outside-realm gateway address.

158. (Previously Presented) The device according to claim 149, wherein said user-resource identifier query is a Domain Name Server (DNS) query.

159. (Previously Presented) The device according to claim 149, wherein said inside address realm is a private address realm and said outside address realm is a public address realm.

160. (Currently Amended) A gateway resource manager for a communication gateway that has a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes, said gateway resource manager comprising:

i) an input configured to receive multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node;

ii) network address allocation circuitry configured to determine an outside-realm gateway address based on a unique combination of one of said limited number of outside-realm gateway addresses and said multiplexing information, said network address allocation circuitry being configured to perform the following tasks prior to initiating establishment of a requested connection:

select, from said outside-realm gateway addresses, a candidate outside-realm gateway address for combination with said multiplexing information;

determine whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection;

repeat, if the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection, the selection of outside-realm gateway address until a unique combination is found that is not already being utilized for another connection.

wherein the unique combination of outside-realm gateway address and said multiplexing information defines an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states, and said network address allocation circuitry is configured for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection based on a comparison in relation to said predetermined set of existing gateway connection states.

wherein said multiplexing information, for an inside-realm initiated connection, includes at least one of outside node address information and outside node port information, said outside-realm gateway state representation is an at least partially complete gateway state representation, and said predetermined set of gateway connection states includes the existing gateway connection states in said gateway; and

iii) resource allocation circuitry configured to initiate establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information.

161. Canceled.

162. (Currently Amended) The gateway resource manager according to claim 46+160.

wherein said network address allocation circuitry is configured for finding said outside-realm gateway state representation based on comparison with corresponding information of said gateway connection states represented in a list representation of said predetermined set of existing gateway connection states.

163. Canceled.

164. (Currently Amended) ~~The gateway resource manager according to claim 161~~A gateway resource manager for a communication gateway that has a limited number of available outside-realm gateway addresses for enabling outside-realm representation of inside-realm nodes, said gateway resource manager comprising:

i) an input configured to receive multiplexing information including at least one of network address information and port information of at least one of said inside-realm node and said outside-realm node;

ii) network address allocation circuitry configured to determine an outside-realm gateway address based on a unique combination of one of said limited number of outside-realm gateway addresses and said multiplexing information, said network address allocation circuitry being configured to perform the following tasks prior to initiating establishment of a requested connection:

select, from said outside-realm gateway addresses, a candidate outside-realm gateway address for combination with said multiplexing information;

determine whether the combination of the selected candidate outside-

realm gateway address and said multiplexing information is already being utilized for another connection;

repeat, if the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection, the selection of outside-realm gateway address until a unique combination is found that is not already being utilized for another connection.

wherein the unique combination of outside-realm gateway address and said multiplexing information defines an outside-realm gateway state representation that has no counterpart in a predetermined set of existing gateway connection states, and said network address allocation circuitry is configured for determining whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for another connection based on a comparison in relation to said predetermined set of existing gateway connection states,

wherein said multiplexing information, for an outside-realm initiated connection, includes at least one of outside node address information and inside node port information, said outside-realm gateway state representation is a partially complete gateway state representation and said predetermined set of gateway connection states includes the existing partially complete gateway connection states in said gateway; and

iii) resource allocation circuitry configured to initiate establishment of said requested connection based on the unique combination of outside-realm gateway address and said multiplexing information.

165. (Currently Amended) The gateway resource manager according to claim ~~164~~164, wherein said input is configured to receive inside-realm network address information corresponding to an inside node, and multiplexing information including at least one of outside node address information and inside node port information;

said outside-realm gateway address is to be used in establishing a dynamic gateway connection state for a flow between said outside node and said inside node through said gateway;

said resource allocation circuitry is configured to request said gateway to establish said dynamic gateway connection state based on said selected outside-realm gateway address, said multiplexing information and said inside-realm network address information.

166. (Previously Presented) The gateway resource manager according to claim 165, wherein said multiplexing information is an outside node address, and said input is configured to request allocation of said selected outside-realm gateway address to said inside node for traffic coming from said outside node address.

167. (Previously Presented) The gateway resource manager according to claim 165, wherein said input is configured to send a request to said gateway for establishment of a partially complete gateway connection state based on said selected outside-realm gateway address, said multiplexing information and said inside-realm network address information.

168. (Previously Presented) The gateway resource manager according to claim 167,

further comprising: means for receiving a reply from said gateway that said partially complete gateway connection state has been created; and

means for notifying said outside node of said selected outside-realm gateway address in response to said reply from said gateway.

169. (Previously Presented) The gateway resource manager according to claim 167, wherein said network address allocation circuitry is configured to select an outside-realm gateway address, which in combination with said multiplexing information, defines a partially complete outside-realm gateway state representation that has no counterpart in any existing partially complete gateway connection state.

170. (Previously Presented) The gateway resource manager according to claim 169, further comprising means for maintaining a list representation of existing partially complete gateway connection states, and wherein said network address allocation circuitry is configured to find said partially complete outside-realm representation based on comparison with corresponding information of all existing partially complete gateway connection states represented in said list representation.

171. (Currently Amended) The gateway resource manager according to claim ~~160~~164, wherein said network address allocation circuitry is configured to determine whether the combination of the selected candidate outside-realm gateway address and said multiplexing information is already being utilized for a connection based on comparison with established

Art Unit: 2446

connections and/or connections under establishment.

CORRESPONDANCE INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin R. Bruckart whose telephone number is (571) 272-3982. The examiner can normally be reached on 9:00-5:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Pwu can be reached on (571) 272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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